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A Working Observation on the Dry Waste Collection Centers in Bangalore

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Abstract

This paper studies the role of Dry Waste Collection Centers (DWCCs) in Municipal Solid Waste Management in Bangalore which were set up following LokAdalat's intervention directing the Municipality to set up these centers to enable ward level recycling. The Karnataka High Court further validated the direction by instructing the municipality to set up necessary infrastructures to facilitate ward level decentralized management of waste for all categories.

The DWCC is a hallmark of the triple bottom line of sustainable business operations– people, planet and profit, and modeled on three corner- stones – Social Considerations, Economic Considerations and Environmental Impact. Based on a zero-subsidy model for operations, the DWCCs are envisioned to meet the environmental objective of managing the MSW recyclable waste stream through responsible recycling. They are also expected to be a hub for social inclusion of the informal sector in the process, and ensure economic viability through market driven delivery mechanisms.

The paper traces the history of DWCCs and studies the operations of 32 DWCCs which have been in operation for more than a year and operated by the informal sector. In addition, the paper will also analyze the effect of dry waste diverted from landfills at the ward level and will provide recommendations to enhancing performance of these centers.

Peer-review under responsibility of the organizing committee of 5IconSWM 2015

Keywords:Dry Waste, Collection Centre, Bangalore

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1. Introduction

Bangalore, like any other city in India followed a centralized system for managing solid waste that off collection, transportation and land filling waste. Recycling within households were limited to selling newspapers and other high value waste to an itinerant buyer or local scrap shop, and the concept per se was not high in priority.

The few community level initiatives in the early 80s and 90s, promoting recycling and retrieval of dry waste did not receive any large scale promotion, till early 2009, when citizens groups got together to promote community based decentralized waste management systems. One of the prominent efforts of citizens level initiative was the conceptualization of the DryWaste Collection centers (DWCCs) in 2010, which stemmed after successful pilots of community based solid waste management system. A detailed study on contract costs revealed that the city was spending an estimated cost of 405 crores, for a total MSW contract of 89 packages for 198 wards.

An analysis of the garbage contract revealed that 48% was being spent on the SWM component of Door to Door collection, including bulk generators and about 52% was being spent on street sweeping*. A cost benefit analysis of Decentralized waste management around by the Solid Waste Management Roundtable (SWMRT) the same year revealed that infrastructure investment in decentralized Waste Management like Market biomethanation, Garden/leaf composting andDWCCs could divert/ manage 53 tons per day about 25% and save the Municipality about 48.8 crores annually, which is about 12% of the total garbage cost.

SWMRT engaged with the LokAdalat, (People's court) a system of alternative dispute resolution (non-adversarial system) from mid 2010, which led to certain significant directions to the BBMP to implement decentralized waste management across the city, including construction of DWCCs, which was further endorsed by the Karnataka High Court in 2012.

Even though the Municpal Solid Waste (Management & Handling) Rules 2000, specified collection of segregated waste at source, the schedule II did not have any specification of dry waste per se. Bangalore was the first city to go ahead and have in place neighbourhood recycling centers. Four years since the LokAdalat's directions the city has still not embraced DWCCs, segregation at source is still not being practiced, acceptance from bureaucrats are still negative, considering that the DWCCs built have not taken into consideration expansion plans, many still lack facilities, or roofing is faulty, and integration of informal sector in managing the DWCCs only account for 4% of the total DWCCs in operation.

The paper is structured as follows. First, a general introduction on the concept of DWCCs, the principles and the parties involved, the evolution of the centers from a historical point of view, the profile of the 32 DWCCs managed by the informal sector and looks at the inflow of waste into the DWCCs, the net diversion rates for six months, along with the savings for the Municipality and will provide recommendations for efficient functioning of DWCCs in the city.

2. The Concept of DWCCs

Dry Waste Collection Centers (DWCCs) are important aspect of decentralized waste management and though the concept was modeled around the neighbourhood recycling centers, was based on the principles of waste hierarchy, to put in practice the three R's – reduce, recycle and re-use at the neighbourhood level. The DWCCs are to facilitate the collection/ buy-back of all dry waste from local residents, contract workers, and waste workersor scrap dealers, integrate informal waste workers into the operations of these centers and encourage/implement extended producers responsibility (EPR) of packaging materials that are not being recycled presently, thus serving as the cornerstone for the triple bottom line of operations – people, planet and profit.
Bangalore became the first municipality to set up DWCCs in the country.

2.1 Principles on which the DWCC were based

- Zero subsidy in operations by Municipality, and implementation of segregation at source by Municipality.

- Operations based on business principles.
- Ensuring recovery of all possible recyclables through buy-back/take-back or drop off schemes.
- Preventing land filling of recyclable and other non-bio degradable material which can be processed alternatively.
- Integrating informal waste workers through employment opportunities in the DWCCs.
- Engaging citizens of a particular locality in recycling by serving as a dissemination point for segregation information etc.
- Create an interface for engagement with Industry to enable them to discharge their extended producers responsibility.
- Provide the facility of warehousing and economies of scale and back-end integration.

2.2 Parties Involved and Responsibilities

In 2010, when DWCCs were conceptualized, it was envisioned on the basis of a tri-partite arrangement between the BBMP who would provide land, infrastructure and ensure inflow of dry waste, an Industry Partner who would provide financial investment and marketing, to exercise EPR and the operator who would manage the day to day operations- which could be an NGO, CSO, waste-picker or scrap dealer. However currently the agreement is only between the operator and the BBMP.

The responsibilities listed in the MOU for the bi-party agreement include:

Municipality: The BBMP

- Enforce segregation at source and direct contractors towards the destination.
- Provision to include waste pickers /scrap dealers to run centers
- Set up the DWCC by constructing a ventilated place with toilet and security room
- Provision of electricity and water facility and payment of bills
- Responsible for repairs and security measures like gate for the compounded area, and necessary beautification like sapling plantation, levelingof the ground. In addition to providing housing facility for the security staff and printing signage and display board
- Direct contractors to DWCC within the ward and enforce segregation at source
- Assist operators in promotion of DWCC and awareness on segregation
- Collect reject waste
- Preference for Waste-pickers/Scrap dealers in the center

The Operator

- Will create awareness programmes on segregation of waste at source in the area
- Is expected to pay a onetime security deposit of Rs. 25000 which is refundable at the end of three years. (In case of SHG or Waste-picker collective Rs. 5000 will be paid in five installments)
- Expected to meet the operation and maintenance costs through the revenue generated from the sale of recyclable materials.
- The DWCCs will be deal only with dry waste and obligated to take any other waste like hazardous waste item, toxic or post production waste and wet waste. Operators may choose to collect e waste and dispose according the law.
- DWCCs will pay minimum of Rs.2 per kg of the mixed dry waste to whoever brings the dry waste to the centers.
- If a company operates, provision to appoint suitable operators for the purpose of running, maintaining, managing and carrying out operations at the DWCC.
- DWCCs will display the purchase value of materials and will appoint labour force for secondary segregation. In addition to ensure safety of health of the workers. It is also expected that the premise will be kept clean and care will be taken on aesthetics, and monthly reports will be sent to the BBMP and documentation available for public

3. Evolution of DWCCS

Late 1970s	Ragpickers Education and Development Scheme (REDS), supported by Marist Brothers Order in Bangalore, designed to help street children who survived by waste picking, launched two experiments on waste purchasing shop and cooperative and both programmes failed (Diana, 1992). The Center of Environment Education (CEE) started waste management initiative and a forum called "Committee for Clean Bangalore" was formed with a vision for cleaning and greening Bangalore.
1989 to late 1990s	MythriSarvaSevaSamithi Trust (MSSS) launched a pilot "Waste Wise project", for 300 households in Jayanagar, where residents were given bamboo basket to hold dry waste and were asked for three way segregation. (High value waste was sold at the household level to itinerant buyers, the low value waste were then sold to local scrap shops (Diana, 1992). Swabhimana- coalition of NGOs launched for a cleaner, greener and safer Bangalore Proper waste management existed in isolated pockets, driven primarily independently by the local Residents' Welfare Association bodies. KalyanNagar was one of the first few localities that took charge in Bangalore and some other localities such as RMV 2nd stage followed as well. Around 45 community based schemes were in existence (Wolfe & Mahadevia, 2008).

1999	Bangalore Agenda Task Force (BATF) was formed, by a government order, where individuals from corporate sector were identified as members, with a mandate to work with stakeholders to achieve the vision of a role model city by 2001, among the others, which included "Swachha Bangalore", to implement best practices in municipal solid waste collection, transportation, disposal and processing.
2000	Formulation of the Municipal Solid Waste Management and Handling Rules, 2000, for cities to manage their waste responsibly. Bangalore's door- to door collection became a reality and set in motion the need to remove the road-side bins. However no large scale effort to emphasize on segregation of waste at.
2003	CEE launched a project titled Environment Improvement Programme for HSR Layout – Implementation of SWM Activities', which mirrored the Waste Wise project, but on a larger scale covering 3000 households in all the seven sectors, and wet waste was sent to Karnataka Compost Development Corporation (KCDC), for composting, a separate shed in Sector 1 was used for secondary segregation of dry waste, ***thus began the evolution of dry waste collection centers***
2003	Samarthan Trust for the Disabled launches "Parisara Waste Management program", which encouraged people to donate newspapers to the organization
2005	Sahaas, an NGO, initiates the first onsite waste management project at State Bank of India, St. Marks Road Campus. Sahaas, begin e-waste recycling, along with separate dry waste collection, and in-situ organic waste management.
2007-08	ITC launched its Wealth out of Waste (WOW) initiative to collect dry recyclable waste from large apartment complexes in Bangalore and Hyderabad, motivating the start of the segregation-at-source counterculture in some middle to upper-middle class citizens of Bangalore
2009	Solid Waste Management Round Table (SWMRT), a citizen interest group dedicated to promoting sustainable waste management in the city was formed in 2009, advocates for segregation of waste at source and decentralization. An unutilized shop space near the market area in Malleshwaram became operational and became the basis for further advocacy In an ambitious plan of creating zero garbage zone, BBMP gets Karnataka Rural Infrastructure Development Limited (KRIDL), formerly Karnataka Land Army Corporation, construct garbage sheds, to be used as transit points to check if waste is not segregated
2010-11	Realizing the futility of citizen's level advocacy, without systems and processes being institutionalized, SWMRT approached LokAdalat. This led to certain significant directions to the BBMP to implement decentralized waste management across the city, including construction of DWCCs in every ward, following the presentation on cost benefit analysis of the garbage contract-centralized vs decentralized. Saahas prototypes Kasa Rasa Unit in Ejipura to manage wet and dry waste from the neighbourhood

3.1 The Growth of DWCCs from 2011

With the direction from the LokAdalat, the first two DWCCs were allotted in March 2011 – HSR Layout and Anandnagar. While Anandnagar started with 200 households by Full Circle, HSR Layout began operations only in August 2011, following a series of awareness programs jointly conducted by IYCN and Radio Active CR 90.4 MHz. The two major objectives of the HSR center were - validating the need for a neighbourhood DWCC by keeping a track of quantities recycled and facilitating better access of waste to waste-pickers and thereby creating livelihood opportunities. A similar project was launched in Gottigere, near Nandi Park Apartments in February 2012. Both the initiatives till January 2013 had recycled over 149562.1 kgs of waste, thus reinforcing the case for neighbourhood recycling centers.

Fig. 1.

Parallel to the developments on the ground, SWMRT also worked on Branding Convention and the Standard Operating Procedures for the centers. Even though the Centers were created as Municipal Recycling program, it was expected that DWCCs would work on business principles, interface with the Municipal workers, integrate the informal economy workers like waste pickers and scrap dealers and provide the entry point for EPR.

However the initial few steps in the commissioning of the DWCCs were very slow, despite the LokAdalat orders. There was limited interest shown by BBMP in scaling up the project and there were only a handful of pilots operating in Bangalore in 2012. BBMP passed up existing sheds constructed in 2009 by Karnataka Rural Infrastructure Development Limited (KRIDL), formerly Karnataka Land Army Corporation as transit points* as DWCC, which were the 6000 square feet double height buildings in Yelankha, Domlur and Malleshwaram. As each of these structures cost upward 40 lakhs each, the cash strapped BBMP was reluctant. In Bommanahalli zones, temporary sheds were constructed in 12 wards. The temporary structure or sheds cost less than one lakh each and were built on the premise that the project would fail.

The construction of DWCC paced up when there was a furor over the garbage crisis in Bangalore. The shutdown of the Mavallipura landfill site by the order of the Karnataka State Pollution Control Board threw the garbage crisis in Bangalore spiraling out of control. Bangalore was sinking in its own garbage, and this crisis also led to the famous Kavitha Shankar Public Interest Litigation filed in court for improvement in the SWM scenario in the city. Many other PILs were clubbed to this and the Karnataka High Court directed the State to implement segregation at source and set up decentralized waste processing (at a ward level) increase citizen involvement in the crisis by the formation of ward committees, revoking existing SWM contracts to retrofit to the new tender guidelines etc.

It was at this time that looking at the better designed Kasa Rasa centres , it was suggested that the BBMP look at more aesthetic , appealing and low cost structures and a prototype model costing about 24 lakhs was designed by Ravi Kumar, who was an architect by profession. However in the interest of quick roll out, the budget were lowered to about 10 lakhs and simple utility shed like structures were finally set up in 2013-2014.

3.2 The Consolidation and strengthening of DWCCs - 2015

At the present DWCCs in the city are in the consolidation phase, with the DWCC operations seeing administrative streamlining, and door to door collections being mandated to drop off the dry waste at the local DWCC. While the ward level monitoring of the operations and the volume inflow has improved, several measures needed to boost operations on ground have to be factored in- like mandating segregation at source, dedicated collection of dry waste in the new garbage contract of 2015, removing the pressure of storage of low value, no value and reject dry waste, supporting Aggregating facility to receive such waste from a cluster of DWCCs etc.

4. Methodology

The study was covered over a period of one year, and included field visits of centers, interview with various actors involved, and the monthly DWCC operators meeting held 29th of every month at HasiruDala. For the purpose of the study the DWCCs under consideration have been limited to 32 and only those where informal workers are operators to gauge the contribution to the city and look at waste diversion rate.

5. Analysis and Assessment

Table 1.

Sl. No.	Ward No	Ward Name
1	12	Shettihalli
2	23	Hennur Cross
3	24	HBR Layout
4	39	Chokkasandra
5	41	Peenya Industrial Area

Sl. No.	Ward No	Ward Name
6	43	Nandini Layout
7	44	Marappannapalya
8	56	A Narayanapura
9	61	S K Garden
10	64/65	KaduMalleshwaram
11	66/76	Gayathri Nagar
12	95	Gandhinagar
13	101	Kamakshipalya
14	102	Vruhsabavathi Nagar
15	103	Kaveripura
16	109	Chikkpete
17	112	Domlur
18	123	Vijayanagr
19	135/136	JJR Nagar and Padarayanapura
20	160	RR Nagar
21	161	Hosakerahalli
22	163	Katriguppe
23	165	Ganesh Mandir
24	166	Karisandra
25	167	Yediyuru
26	168	Pattabhiramnagar
27	169	Byrasandra
28	170/171/177	Jaydeva Hospital
29	178	Sarakki
30	183	Chikkalasandra
31	194	Gottigere
32	195	Konnankunte

5.1 Size and Facilities

a) Size of the DWCC

The DWCCs so built differ in the built size and from the chart it is evident that 56% of the DWCCs are of 25*30 size, with the lone exception of a 80*45 and 15*20. The BBMP has not made any concerted plans to assess the size of the ward or the no of households. The locations of centers have not been planned, and some centers suffer from accessibility in terms of pks or autos using the center due to distance or approach road being unrepaired.

While it was expected to manage a capacity of one ton each, some of the centers can barely manage about 300 kgs of inflow due to the irregular size of construction.

For lack of space, the BBMP has also clubbed wards to certain centers like the following, with little or no calculation of the inflow of waste from the wards to the size of the centers, thus undermining the capacity to perform effectively.

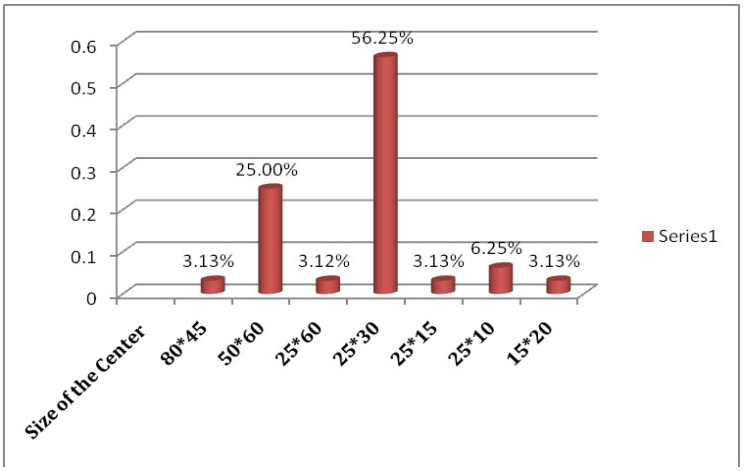

Fig. 2.

10	64/65	KaduMalleshwaram	50*60
11	66/76	Gayathri Nagar	50*60
19	135/136	JJR Nagar and Padarayanapura	15*20
28	170/171/177	Jaydeva Hospital	25*60

b) Facilities in the Centers

As per the MOU, it is evident that the BBMP is responsible for basic infrastructure and provision of equipments like the weighing machine and bailing machine, along with racks, tables and chair. Of the 32 DWCCs, while 97% have electricity connection, only 75% have water and 65.6 % have toilet facilities. And while most operators have purchased weighing machines, only 43% of the DWCCs have bailing machine.

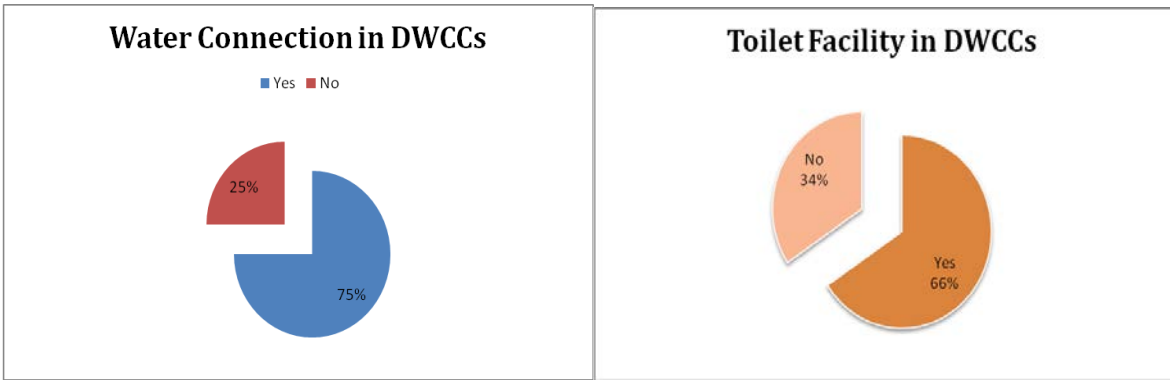

Fig. 3.

The BBMP is clearly in the lacking, for the none of the centers surveyed fall in as per the BBMP circular, which states that the basic size of the center must be of 96 sq.ft There is inconsistency of infrastructure between wards in terms of the building size and facilities. Some centers are also badly constructed that rain water seeps in, and some centers are so small that waste has to be stored outside, resulting in more problems of aesthetics

5.2 Management Models and Labour and Livelihood Impact

The administration and management of each of the centers is facilitated by HasiruDala or its partners. Of the 32 centers 59% of the centers are run by scrap dealers and 41% by waste-pickers.Each center has a minimum of two

sorters, with some centers employing over seven sorters. On an average the most centers pay around Rs. 350 for males and between Rs. 300- 325 for females. The average cost of labour per day being around Rs. 1280/- .

Total jobs created by 32 DWCCs = 161. Given that India generates 100000 non-IT blue collared jobs annually, 32 DWCCs have managed to create 0.161% of jobs.

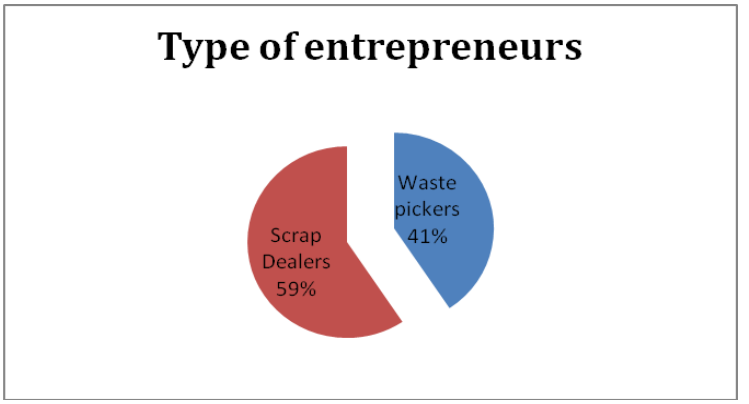

Fig. 4.

5.3 Inflow of waste and working capital requirements

All the DWCC's operate seven days a week, and the source of waste for most of DWCCs are from PKs, auto tippers with the exception of Ward no 168 Pattabhiramnagar, which supports itself by the innovative Donate Dry Waste Program (A voluntary program encouraging residents to donate dry waste weekly).

a Inflow of waste

While 35% of the DWCCs receive between 300 to 500 kgs of waste per day and about 28 % receive between 500 to 800 kgs per day. Surprisingly only 6 % of the DWCCs receive more than 800 kgs per day and similar percentage receives less than 6%

A focus group discussion with DWCC operators revealed that in wards where the on ground officers are pro-active in directing contractors to deposit waste, coupled with periodic PK trainings, along with the centralized location of the center the waste inflow has been higher.

5.3 b Working Capital

About 28% of the DWCCs require between Rs. 24000 to Rs. 32000 of working capital every day. Less than 3% require above Rs. 48000 per day, which translates into higher waste inflow and advances to labour and transportation costs.

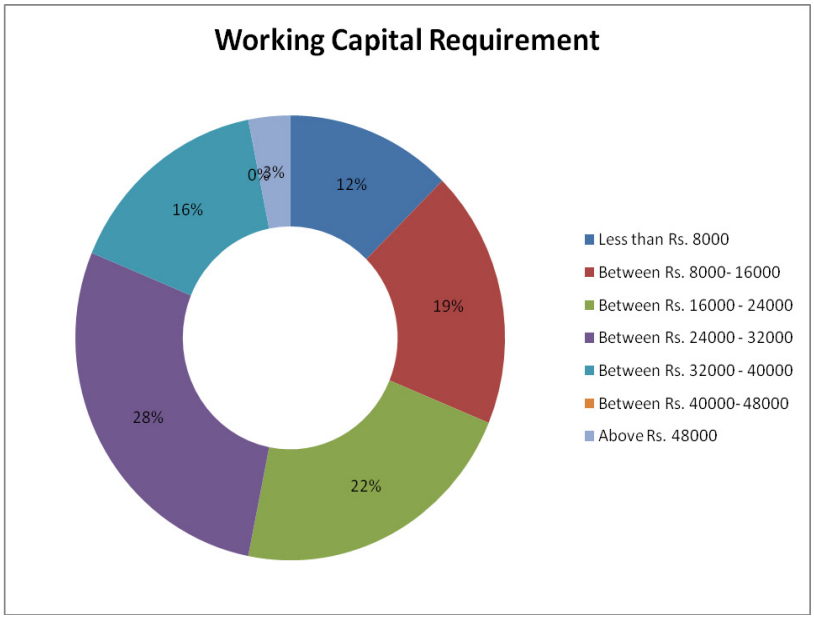

Fig. 5.

6. Waste Diversion from Jan to July 2015

Given the operating challenges, vis-a-vi the infrastructure, the location of centers, the lack of enforcement of segregation at source and the lack of facilities by BBMP, the DWCCs, havemade exceptional progress in waste diversion and retrieval of dry waste of over 23, 73,908.8 kgs.

Table 2.

Sl.	Ward No	Ward Name	Total quantity from Jan – July 2015
1	12	Shettihalli	85641.5
2	23	Hennur Cross	25997.8
3	24	HBR Layout	61975.5
4	39	Chokkasandra	98253.5
5	41	Peenya Industrial Area	54838.2
6	43	Nandini Layout	43891.8
7	44	Marappannapalya	202704
8	56	A Narayanapura	117121
9	61	S K Garden	140669
10	64/65	KaduMalleshwaram	113776
11	66/76	Gayathri Nagar	52225.8
12	95	Gandhinagar	41545.5
13	101	Kamakshipalya	63335.3
14	102	Vruhsabavathi Nagar	11064.5
15	103	Kaveripura	3352
16	109	Chikkpete	214703
17	112	Domlur	63168
18	123	Vijayanagr	78295.8
19	135/136	JJR Nagar and Padarayanapura	23582.8
20	160	RR Nagar	10438.9

Sl.	Ward No	Ward Name	Total quantity from Jan – July 2015
21	161	Hosakerahalli	90467.8
22	163	Katriguppe	38593.5
23	165	Ganesh Mandir	49270.4
24	166	Karisandra	17777.8
25	167	Yediyuru	62390.5
26	168	Pattabhiramnagar	35298.8
27	169	Byrasandra	30937.8
28	170 /171/ 177	Jaydeva Hospital	176523
29	178	Sarakki	58904
30	183	Chikkalasandra	22433
31	194	Gottigere	187346
32	195	Konnankunte	97386.3
Total			**23,73,908.8**

6.1 Calculations in the study

The assumptions in the study to calculate the percentage of waste retrieval by 32 DWCCs and the savings to the BBMP are based on the following assumptions of waste generation and composition of waste

Assumptions

a) Bangalore's waste generation: For the purpose of this study it is assumed that Bangalore generates about

Table 3.

Tons per day	Tons per month	Tons for six months	Tons per year
4500	135000	8,10,000	16,20,000

b**) Composition of waste:** It has been assumed that :

Table 4
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Composition	TPD	%
Organic	2700	60%
Inorganic	1215	27%
Sanitary	180	4%
Inert	405	9%
Total	**4500**	

Retrieval Percentage

With the assumption that 27% is dry waste

Table 5.

	Tons per day	Tons per month	6months
	1215	36450	2,18,700
50% High Value waste			109350
Balance 50% of waste generated in 32 wards			17673 tons
Recovery from 32 DWCC for 6 months			2373 tons
% of recovery			13%

If 27% is dry waste, which is about 2, 18,700 tons. It is assumed that about 50% of the Dry waste is High Value or other material like Wood, Cloth which the DWCCs will not receive. Of the remaining 50% 32 Wards will generate about 17673 TPD of which 2373 TPD have been recovered. Then 32 DWCCs have managed to retrieve about 2373 tons, which is about 13% of the Dry Waste stream.

1. The total capital investment by the BBMP made into the DWCCs stated as per the High Court submission is about 21 crores for 150 DWCCs, therefore proportionately Rs.4.52 crores have been spent on 32 DWCCs.
2. The DWCCs have an average capacity of 1TPD per centre.
3. At the present rate of inflow of dry waste of 13TPD this is about 41% of the capacity of the DWCCs
4. The Savings in transport calculated per Submissions made to High Court is Rs. 1014 per tonne of dry waste , from the savings made in secondary leg of transportation
5. The Annual savings is about Rs. 48.79 lakhs. If the DWCCs were to operate at 100% capacity the annual savings of R.s 1.18 crores will help to recover the cost of investment by BBMP in about 4 years.

6.2 Case Study: One Year Collection of Coconut Shell Waste under Dry Waste Stream

Disposing Coconut Shells till recently posed a huge challenge and given Bangalore's expanse logistically it was difficult to aggregate the waste as there were no decentralized outlets for collection. In August 2014, about five DWCC's began accepting coconut shells as part of the dry waste stream and collected around 5834 kgs of coconut shell. Though the first three months, collection was low, it soon picked by volumes and in November 2014 about 13 DWCCs collected about 11176 kgs of coconut shells.

One year down the line, 25 DWCCs have managed to divert over 182739.5 kgs from the landfill, which proves that decentralized facilities have avenues to retrieve waste that would have otherwise landed up into andfills

Savings to the BBMP

Table 6.

Capital cost of 32 DWCC	**No of DWCCs**	**Capacity @ 1 TPD**	**Dry Waste received**	**Capacity Utilized**	**Savings in transport**	**Savings per day**	**Annual Savings**
Rs. (in lakhs)	TPD	TPD	TPD	%	Rs	Rs	Rs
452.32	32	32	13	41%	1014	12,368	48.9

Aug -14	**Sep -14**	**Oct -14**	**Nov-14**	**Dec-14**	**Jan- 15**	**Feb- 15**	**March15**	**Apr- 15**	**May-15**
5834	2545	4133	11176	9204.5	8857	11081	19780	23529	24748

Jun- 15	**Jul- 15**	**Aug-15**	**Total Qtykgs**
18802	23537	19516	**182739.5**

7. Conclusion

It is evident that Bangalore harbours a huge potential for recycling, and the BBMP needs to act by investing in infrastructure, expanding and upgrading existing centers. In addition, DWCCs must be allowed incubation and gestation period, for them to stabilize operations, develop innovative methods to engage with local residents. Immediate results on the efficiency of DWCC can happen, only if BBMP rectify its operations, enforce segregation at source, and penalize both residents for non-segregation and contractors for non-transportation of waste to the destination. It is also evident that informal sector integration in DWCCs is a must, as they help compliment existing waste services. Immediate attention must be given to low- value waste and there needs to be a state policy on EPR.

8. Recommendations

- The BBMP needs to put in place a strategy to increase the city's recycling participation and enforce segregation at source through implementation of fines and penalty and incentivizing positive behavior over a sustained period.
- Ward level developmental goals can be set up, with greater accountability from the corporators
- Educate residents on segregation and waste categories, on a continual basis
- Care must be taken to ensure that residents are assured of a reliable service of separate collection by waste streams
- Integration of informal sector in collection of dry waste and managing dry waste centers must be mandated
- Centers need to be upgraded and additional facilities must be provided. Centers that lack bailers, racks, signagesetc, must be provided the same at the earliest. The BBMP website needs to have a complete database of centers, with capacity of each centers, and plans for upgradation.
- Centers that are located in accessible locations, must be used as a storage center for low value and no value waste and additional centers must be constructed.
- Create a State/ National Level EPR policy (Extended producer responsibility) assigning landfill costs to the producer, rather than tax paper, to push for more efficient packaging which would in turn lead to comprehensive recycling methods by implementing take back policy.
- Access to micro-finance companies must be made available to the center operators
- Given that SWM is not featured in the land use plan of Bangalore

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